CLAIMS

WE CLAIM:

1. A tool kit for use in providing a predetermined clearance between an impeller and a shroud each mounted about a central axis of a jet engine assembly, wherein the shroud has a mating surface, and the impeller and at least a portion of the shroud are disposed within a casing having a mating surface, wherein the shroud mating surface and casing mating surface are configured to mate with an inlet housing having corresponding inner and outer mating surfaces, respectively, the inlet housing having a distance between planes in which the inner and outer mating surfaces lie, the tool kit comprising:

a hub having first and second sides and an opening extending therethrough, the first side having first and second mating surfaces configured to mate with the shroud mating surface and the casing mating surface, respectively, the hub having a distance between planes in which the first and second mating surfaces lie, wherein the hub distance is less than the inlet housing distance; and

an adjustment member configured to couple between the hub first mating surface and shroud mating surface, wherein the adjustment member has a thickness that is substantially equal to the difference between the hub and inlet housing distances.

2. The tool kit of claim 1, further comprising:

a measuring tool coupled to at least a portion of the hub, the measuring tool configured to provide at least one measurement from a point in a plane proximate the hub to a point on the jet engine assembly.

3. The tool kit of claim 2, wherein the measuring tool further comprises:

an arm having first and second ends, the first end coupled to the hub; and

a measuring gauge coupled to the arm.

4. The tool kit of claim 1, wherein the hub includes a plurality of bores extending between the hub first and second sides, each bore configured to receive a fastener to couple the hub to the jet engine assembly.

5. The tool kit of claim 1, wherein the hub is ring-shaped.

6. The tool kit of claim 1, wherein the jet engine assembly further comprises a seal housing, wherein the shroud is axially coupled to the seal housing, the tool further comprising:

an arm coupled to at least a portion of the hub and configured to contact the seal housing to selectively raise and lower the seal housing away from and toward the shroud, respectively.

7. The tool kit of claim 6, further comprising:

a plate configured to couple to the seal housing and increase the area with which the arm can contact.

8. The tool kit of claim 7, wherein the arm further comprises first and second ends, wherein the first end is coupled to the hub and the second end includes two arms configured to contact the plate so that when force is applied to or removed from the first end, the second end raises or lowers the seal housing, respectively.

9. The tool kit of claim 1, wherein the hub comprises aluminum.

10. A tool for use in providing a predetermined clearance between an impeller and a shroud each mounted about a central axis of a jet engine assembly, wherein the shroud has a mating surface, and the impeller and at least a portion of the shroud are disposed within a casing having a mating surface, wherein the shroud mating surface and casing mating surface are configured to mate with an inlet housing having corresponding inner and outer mating surfaces, respectively, the inlet housing having a distance between the planes in which the inner and outer mating surfaces lie, the tool comprising:

a hub having first and second sides and an opening extending therethrough, the first side having first and second mating surfaces configured to mate with the shroud mating surface and the casing mating surface, respectively, the hub having distance between the planes in which the first and second mating surfaces lie, wherein the hub distance is less than the inlet housing distance.

11. The tool of claim 10, further comprising:

a measuring tool coupled to at least a portion of the hub, the tool configured to provide at least one measurement from a point in a plane proximate the hub to a point on the jet engine assembly.

12. The tool of claim 11, wherein the measuring tool further comprises:

an arm having first and second ends, wherein the first end is coupled to the hub; and

a measuring gauge coupled to the arm.

13. The tool of claim 10, wherein the hub includes a plurality of bores extending between the hub first and second sides, each bore configured to receive a fastener to couple the hub to the jet engine assembly.

14. The tool of claim 10, wherein the hub is ring-shaped.

15. The tool of claim 10, wherein the jet engine assembly further comprises a seal housing, wherein the shroud is axially coupled to the seal housing, the tool further comprising:

an arm coupled to at least a portion of the hub and configured to contact the seal housing to selectively raise and lower the seal housing away from and toward the shroud, respectively.

16. The tool of claim 15, further comprising:

a plate configured to couple to the seal housing and increase the area with which the arm can contact.

17. The tool of claim 16, wherein the arm further comprises first and second ends, wherein the first end is coupled to the hub and the second end includes two arms configured to contact the plate so that when force is applied to or removed from the first end, the second end raises or lowers the seal housing, respectively.

18. The tool of claim 10, wherein the hub comprises aluminum.

19. The tool of claim 10, wherein the hub opening is configured to receive a mic bridge.

20. A method for providing a predetermined clearance between an impeller and a shroud of a jet engine assembly, wherein the shroud has a mating surface, and the impeller and at least a portion of the shroud are disposed within a casing having a mating surface, wherein the shroud mating surface and casing mating surface are configured to mate with an inlet housing having corresponding inner and outer mating surfaces, respectively, using a tool kit comprising a hub having first and second mating surfaces, each configured to mate with the shroud mating surface and the casing mating surfaces, and a central opening extending therethrough, and an adjustment member configured to couple between the hub first mating surface and casing inner mating surface, the method comprising:

determining a first distance between the planes within which the inner and outer mating surface the inlet housing lie;

determining a second distance between the planes within which the first and second mating surface of the tool lie;

calculating a difference between the first and second distances; and

selecting an appropriately dimensioned adjustment member, based, at least in part, on the calculated difference.

21. The method of Claim 20, further comprising:

placing the adjustment member on the shroud mating surface; and

coupling the hub inner mating surfaces to the shroud mating surface, such that the adjustment member is located therebetween.

22. The method of Claim 21, further comprising:

obtaining at least one drop measurement from a plane proximate the assembly to a point on the assembly to determine an actual distance between the impeller and shroud; and

determining a difference between the actual distance and the predetermined clearance.